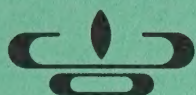


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THE DEPARTMENT OF EDUCATION FOR THE PROVINCE OF ONTARIO

KINAESTHETIC

METHODS

SPECIAL EDUCATION SECTION
DEPARTMENT OF EDUCATION
TORONTO, ONTARIO

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CONTENTS

	<u>PAGES</u>
A Kinaesthetic Methods	1
Diagram of Areas of Brain Involved	2a
B Classroom Techniques	3
1. For Children Without Printed Symbol Experience	
(I) Large Muscle Experiences	3
(II) Small Muscle Experiences	4
2. For Children Experiencing Difficulty With Printed Symbols	
I Fernald-Keller Method	8
II Monroe Sounding-Tracing Method	10
III Gates Visual Imagery	11
IV Combination Methods	12
V Gross Motor	16
C References	17



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KINAESTHETIC METHODS

Kinaesthetic methods refer to using the child's body parts that are involved in moving and touching as learning sources in addition to his ears and eyes.

Regular classroom methods generally rely heavily upon the child's senses of hearing and seeing with emphasis upon the latter. Learning is most efficient when as many senses as possible are involved. Kinaesthetic methods are designed to use tactile touch and muscular senses in combination with visual and auditory senses.

For the exceptional child, the assumption that classroom learning takes place only through the sense organs of sight and sound, is erroneous. Many exceptional children have some physical defect of the eye or ear. Obviously, this interferes with the reception of visual or auditory stimuli. There are other children who have defects of the nervous system or areas of the brain that interfere with the transmission, interpretation and recall of environmental stimuli received from the eye and the ear. Stimulation of the touch and muscular senses in combination with the other senses has been found to be helpful in the learning situation and for many children make learning more efficient.

Diagram I indicates three of the main input systems for environmental stimuli (i.e. visual, auditory, and kinaesthetic) and the main output system, (i.e., voluntary motor).

Developmentally, tactile learning precedes learning by the other senses and activates kinaesthetic sensations. What is kinaesthetic sensation? Most of us are unaware of the kinaesthetic sense in our everyday behaviour. This sense has reference to the receptors (nerve endings) located in the muscles, tendons and joints, that are activated by body movements, position and tension in various parts of the body. The tactile and kinaesthetic senses provide the basis for spatial orientation to one's environment. Every time we sit, walk, talk, smile, speak, etc., the kinaesthetic senses are activated. These senses regulate body movements and are basic to all muscular skills. When we think of muscular skills,

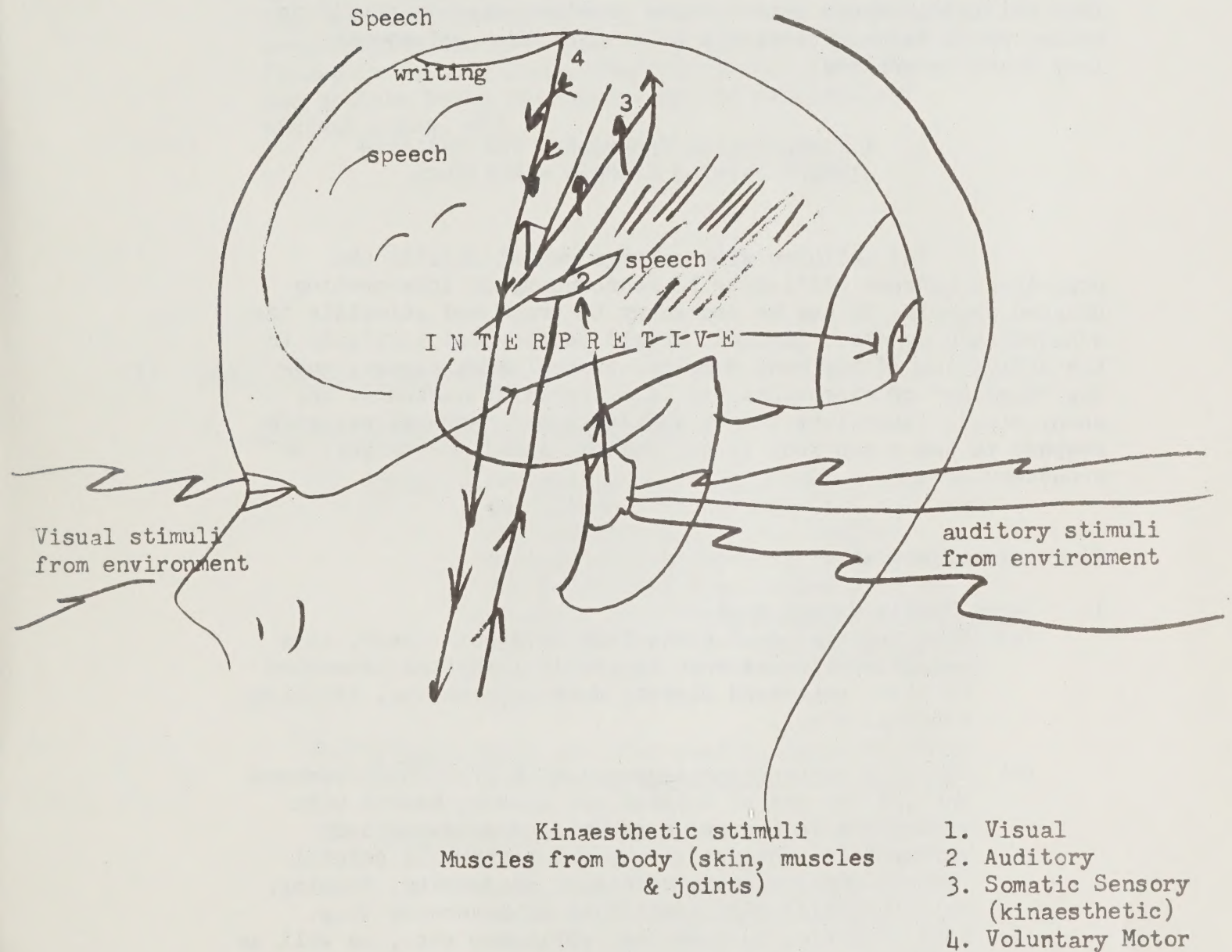
we are included to consider only those involved in gross body movement such as walking, running, etc.. We often overlook the finer muscle movements in manual co-ordination, and the mechanisms involved in speech, vision and hearing. All of these are basic to learning academic work. For many learning difficulties, instead of providing only for qualitatively different visual and auditory stimuli (i.e. different words and readers), it is necessary to activate and integrate the kinaesthetic senses in combination with both the visual and auditory senses. By involving the kinaesthetic senses in learning, defects in the other senses often may be compensated for and learning is facilitated. Thus, rather than having only seeing and hearing experiences, the child also feels the world of sight and sound.

Kinaesthetic methods have been applied successfully with children who have severe reading and spelling disabilities, auditory and visual defects, and recall disabilities. These defects are often exhibited by reversals of letters and letter sequences in spelling, and addition of syllables to words written or spoken. Essentially, these methods involve the combinations of movements, touch, sight and sound to reinforce and integrate what is seen and what is heard. The methods include activities such as simultaneously tracing and sounding words, letters and phonic combinations that are to be learned. The activities use paper, sandpaper, sand and glue, plasticine, etc..

These methods are by no means new. In early Greek and Roman education, kinaesthetic methods of tracing were employed with a stylus on wax and ivory tablets. Montessori advocated the use of direct finger contact in tracing. On this continent Fernald, Munroe and Gates recommend kinaesthetic methods with some remedial pupils. Their methods assume that the child has some experience with written or printed symbols and are outlined briefly.

DIAGRAM I

The main areas of the brain involved in kinaesthetic, visual and auditory stimulation from the environment and voluntary motor movement



The shaded speech area is important in terms of body image and spatial relations. The upper portion of this area is significant in terms of right and left orientation.

The interpretive centre is the area where experiences are interpreted, recorded and reactivated.

Classroom Techniques

It should be emphasized that kinaesthetic methods are not intended to be used in isolation, but rather in combination with other approaches. Also the kinaesthetic methods are not always effective with every child. It has been shown that relatively short interspersed practice periods result in better performance of a simple motor task than infrequent long practice periods.

A KINAESTHETIC TECHNIQUES FOR CHILDREN WITHOUT PRINTED SYMBOL* EXPERIENCE

For children with average mental ability who experience extreme difficulty in reproducing or interpreting printed symbols, it may be necessary to train and stimulate the kinaesthetic senses. Emphasis should be directed initially to the activation of big body muscles, tactual experiences, and the "feeling" of directionality (i.e. forward, backward, up, down, etc.), laterality (right and left) and postural set with respect to one's own body (i.e. leaning, standing upright, or crouched).

Some suggestions are:

1. Large Muscle Experiences

- (a) Free expression of gross body movements (legs, arms and trunk) in response to auditory rhythms presented by piano or record player (dancing, running, skipping, hopping, etc.).
- (b) Directed control and expression of gross body members through the use of balance and walking boards with variations in forward backward and sideward body movements.** The use of musical rhythms is helpful. Various physical movements such as jumping, hopping, skipping, tiptoeing, imitation of movements (e.g. both dramatic, such as the rabbit hop etc., as well as teacher imitated movements) should emphasize both left and right members of the body in various combinations.

* Both letter and number symbols

** For more detailed suggestions see Kephart, N.C. - The Slow Learner in the Classroom.

The use of music with body movements assists in integrating the auditory and kinaesthetic senses and provides for discrimination experiences which give meaning to sounds that are basic to learning the 3 r's. It is important that the musical rhythms have different qualities (e.g. fast and slow, loud and soft, high and low, piano, drums, etc.). Rote vocalization accompanying the movements is also useful (London Bridge is Falling Down, One, Two Button Your Shoe, the actions being performed, square dancing, and musical games, etc.)

II Small Muscle Experiences

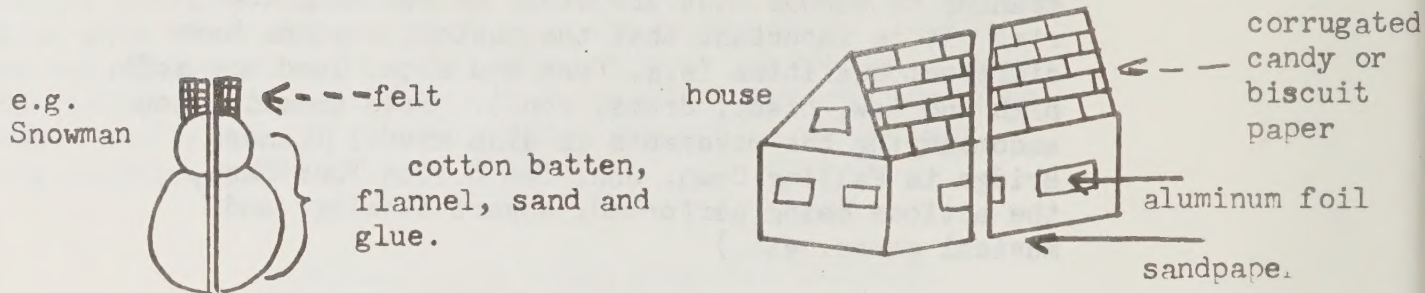
1. Tactual-kinaesthetic experiences

- (a) Games - Various textured materials & objects are placed in a surprise box and used for guessing games that utilize tactual and kinaesthetic clues only. The child with eyes closed selects material or objects from a box and describes the "feeling" of the objects, one at a time, and identifies them by name from tactual clue only.
- (b) Finger plays are also useful, depending upon the age of the child.
- (c) Body tracing - the teacher may trace with her finger various forms on the child's back, palm or under-arm, while the child tries with eyes closed to identify the form.

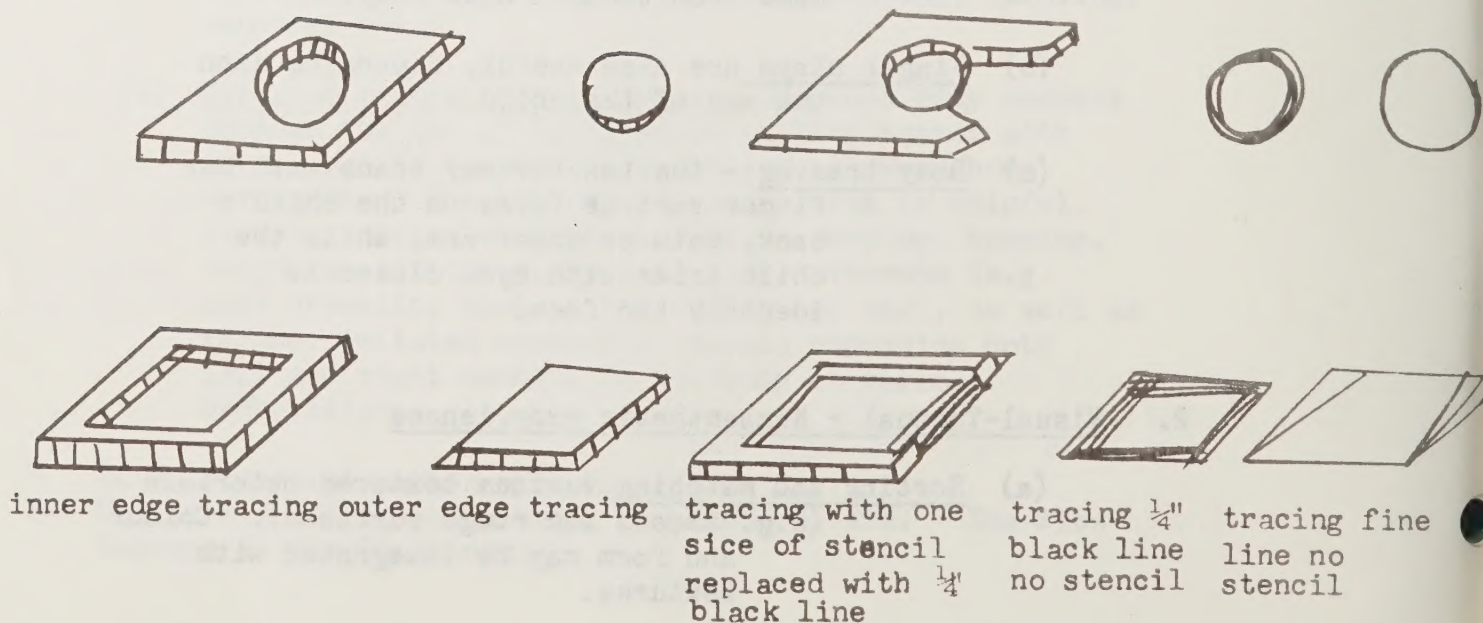
2. Visual-Tactual - Kinaesthetic experiences

- (a) Sorting and matching various textured materials (e.g. smooth and rough surfaces). Colour and form may be integrated with textures.

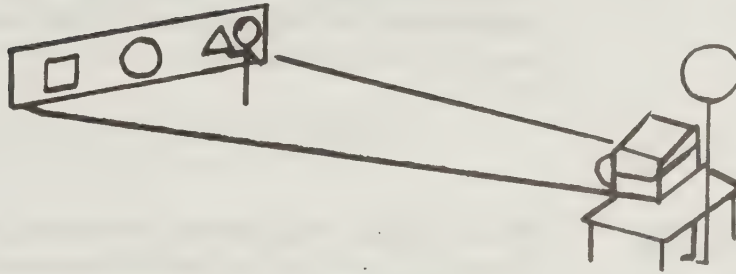
- (b) Puzzles - Prepare simple textured puzzles using many different textures. The child and/or teacher may make these. These provide the child with tactual-visual experiences combined with form.



- (c) Stencils - Training in the discrimination of simple geometric forms may be provided by the preparation of thick cardboard stencils (e.g. circles, squares, triangles, etc.), which the child may trace with fingers, crayons or pencils around both the inner and outer edges with eyes, both open and closed. The child requires many experiences with basic forms prior to experiences with letter & number symbols. The child progresses from this stage to the tracing of forms without the stencil, to the stage of visual recall and the reproduction of the shape.



- (d) Slides - the use of slides of various geometric shapes projected onto the blackboard enables the child to trace them with his finger or with chalk.



- (e) Pencil flashlight - Continuity and direction of manual movements may be facilitated by the teacher projecting a narrow beam which the child is required to follow with the fingers. The beam may be projected upon paper or on the blackboard.

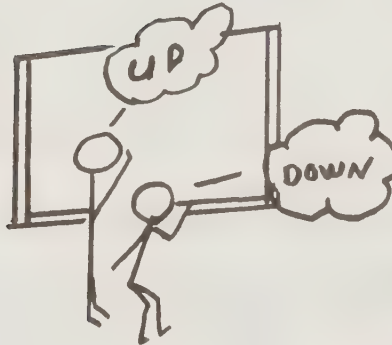
- (f) Flannel boards and materials are useful for the child to feel and name objects with eyes open and then closed. It is important with younger children that they feel, look and name.

3. Visual-Auditory Tactual-Kinaesthetic experiences

- (a) Naming and Identifying objects - Rhythmical naming of objects accompanied by tapping and clapping to word syllables as well as pantomime demonstration of the use of the object is useful. One should proceed from the physical movement to concrete objects, to pictures of the objects, then to symbols of the objects. Rhythm is important in kinaesthetic tactual experiences. It is also important to remember that similar sounding words and sounds are more difficult to learn than those which are distinctly different. The teacher should keep this in mind in preparing materials. For variation and depending upon the age of the child, musical instruments such as the horn may be used for blowing the number of syllables rather than tapping or clapping.

(b) Finger-painting to music, while the child reproduces various geometric shapes has been found helpful. Verbalizations should accompany the movements. The teacher can also experiment with wet clay, chalk, etc..

(c) Blackboards (both small individual blackboards as well as the large classrooms ones) may be used as a variation of finger-painting to music. This media is especially useful for vertical and horizontal lines, where the child is encouraged to rhythmically move the whole body, bending the knees for vertical lines and verbalizing "up" and "down" as he performs.



KINAESTHETIC TECHNIQUES FOR CHILDREN
EXPERIENCING DIFFICULTY WITH PRINTED SYMBOLS*

1. Fernald-Keller Kinaesthetic Method

"...lip and hand kinaesthetic elements seem to be the essential link between the visual cue and the various associations, which give it word meaning. In other words, it seems to be necessary for the child to develop a certain kinaesthetic background before he can apperceive the visual sensations for which the printed word form the stimulus. Even the association between the spoken and the printed word seem not to be fixed without the kinaesthetic links".**

In the Fernald kinaesthetic method of instruction there are essentially three main steps - look and say
- trace and say
- write and say

The following procedure is followed:

- (i) The teacher writes the word to be learned in large script or print on a 3" x 10" card. (Note: Words should be from the child's spoken vocabulary and be related to some meaningful experience).

SWIMMING

Swimming

- (ii) The child traces the word with direct finger contact (One or two fingers of the dominant hand), saying each part of the word as he traces.



(Note: verbalization is not of each letter, but rather the sound of each part of the word and emphasis is on free flowing articulation and hand movements. It is important that the child relate the sound of the word to the form of the word so that at a later stage the child will recognize the word by its visual stimulus alone.)

This step is repeated as often as necessary to ensure accuracy in the writing the word without looking at the copy.

- (iii) The child writes the word without the copy. Errors are corrected immediately. If an error occurs within a word the child begins again and does not persist in attempting to correct the error within the word.
- (iv) The child writes the word in his story.
- (v) The teacher types the child's story.
- (vi) The child reads the story in print.
- (vii) The child files the word cards alphabetically in his word file.
- (viii) The child is shown the word form only the following day and attempts to write it from visual memory.
- (ix) The teacher can show ingenuity by improvising additional tracing procedures. e.g. Large pegboards may be used to outline short words for finger tracing.

* Both number and letter symbols

** Fernald, G.M. & Keller, H. Effect of Kinaesthetic Factors in the Development of Word recognition in the Case of Non-Readers. Jr. Educational Research, Vo. IV(1921), pp 355-357

Fernald states that the average tracing period is about two months with a range from one to eight months. When tracing is no longer necessary, a smaller card file is substituted for the larger one.

The Fernald kinaesthetic method utilizes the speech-motor and hand-motor techniques to establish the "feeling" of words. This method involves no formal training in phonics. In the tracing stage the sounds of letters or letter combinations are disregarded. Emphasis is on the word as a whole, rather than its parts.

2. Monroe Sounding - Tracing Method

This method is different from the Fernald method in that the child traces with a pencil and the tracing experience is considered supplementary to the main purpose of phonic training. Tracing is employed only where the child experiences memory difficulty in associations between auditory and visual stimuli. Emphasis is placed upon the sounds of separate letters and their combinations in the work. Thus emphasis is from details to wholeness of the word through the phonic approach.

The steps in the procedure follow:

- (i) The teacher writes the word or letter to be learned in large handwriting. (Letters precede the learning of words - 5 or 6 consonant sounds are first learned, followed by vowel sounds.)
- (ii) The child traces with a pencil (the pencil is not lifted until the child reaches the end of the word) over the letter or letters of the word, while simultaneously pronouncing each letter by sound slowly.

(This stage of tracing and sounding separate letters is repeated 3 or 4 times and then presented for recall without tracing).

(Note) Emphasis is upon articulation and movements and shape of the mouth. A mirror is often used in this regard.)

Example: -"See this word? This word is man. Say man. Now let me see how slowly you can say man, like this, m-a-n. Now I want you to do 2 things at the same time. Take your pencil and trace over this word while you say m-a-n slowly. Be sure to trace quickly enough and speak slowly enough that you will come out just even".*

(iii) All the words that are learned are listed systematically, traced manually and reviewed frequently.

* Monroe, M-Children Who Cannot Read, p. 119-120

(iv) Words are presented on cards for recall.

Tracing is employed in this method to help the child link the separate elements of a word into a unit. This method emphasizes a speech-motor method of kinaesthetics, although the hand-motor may be involved in the tracing of words.

3. Gates - Visual Kinaesthetic Imagery

Gates recommends greater emphasis upon visual stimuli for pupils of extreme reading disability and considers the main value of the Fernald & Monroe methods is their contribution to a left-right orientation for the child.

Gates recommends a visual-motor method. This method is illustrated by the following example taken from Fernald, G.M., Remedial Techniques in Basic School Subjects, p.323.

"The pupil was asked 'to close his eyes and "see in his mind's eye" the word he had observed. He was encouraged to see it part by part, in the left-to-right order, and then as a whole. If the word could be divided into syllables, he was asked to say the syllables softly to himself, while visualizing them simultaneously. Later, as he learned to write, he was asked to visualize the syllables as he wrote and sounded them.'"

Harris provides further details of this method. He recommends the method for experience difficulties with visual memory and phonics.

Gates also admits of the use of kinaesthetic approach, which is much the same as the visual one outlined above. This method is recommended only if the reading disability is very extreme and after the teacher has tried the usual devices (word observation, context clues, left-right orientation and visual and auditory analysis). In his kinaesthetic approach the word is written and pronounced more often and the child is asked to get the "feeling" of the word.

For example, the child is told, "Say the word and pronounce it as often as you like, trying to get the feeling of how it is written correctly". After writing the word several times, the child is told, "Now close your eyes and write the word the way you feel it should be written". "Does it feel right?"

These methods should not be used exclusively for weeks or months. The main purpose is to observe words and develop consistency in left-right orientation.

Modification of any of the above methods is possible through the use of media other than pencils and paper, or cards. The aim in the use of any media should be the arousal of the kinaesthetic sense. A few variations are suggested below.

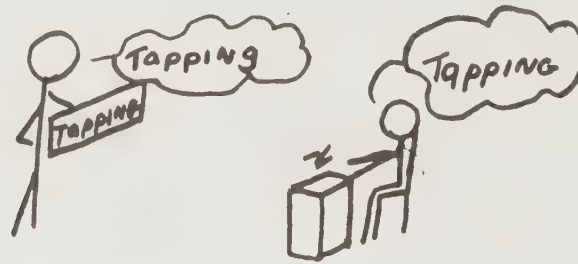
4. Combined speech-motor, Hand-motor and the auditory & kinaesthetic sense

(a) Clapping or Tapping

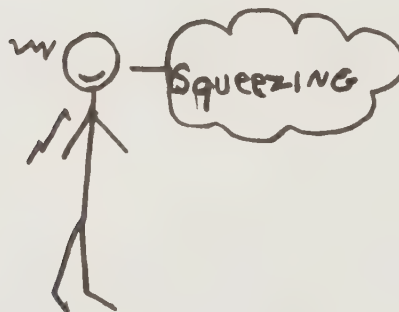
The child may be asked to clap or tap to word syllables while sounding them. Rhythm instruments such as drums may also be used. Drums may be made by the children during craft periods from wooden kegs, large cans, barrels, etc., with the ends removed and covered with either skin or rubber sheets, stretched taught over the openings. It should be emphasized that any instruments used should emit a clear pronounced sound for each tap with the finger or hand. Those instruments employing the direct finger or hand contact are recommended.

The method of presentation would be:

1. The teacher says the word carefully emphasizing each syllable.
2. The child repeats the word as given by the teacher together with the sound of the instrument or the hands to accompany the syllables.



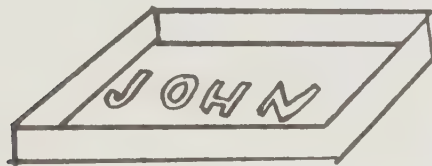
- (b) Squeezing a resistant object or media while vocalizing syllables or words is also useful. The muscular tension created by squeezing helps to activate both the kinaesthetic sense and the central nervous system. Material such as hard plasticene or a hand spring grip might be used.



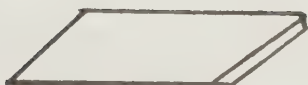
5. Combined speech-motor, hand-motor, and both the auditory, visual and kinaesthetic senses

Tracing experiences

- (a) Plaster of paris molds of various letters and words may be prepared for the child to trace by direct finger contacts as he vocalizes. The use of colour for parts of words or letters is useful in helping the child through visual discrimination difficulties. The molds may be made in the lids of metal cookie tins.



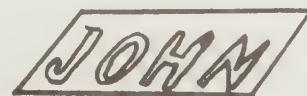
- (b) Overlay material such as "poly" film or heavy gauge plastic sheeting may be prepared as covers for flashcards with the printed symbols. The child may trace either by hand, felt pen, or china clay all-surface pencils. The tracing on the "poly" film or plastic sheet covers may be erased and thus preserved for continued use. Pin pricking the "poly" film cover to coincide with the symbols of the flashcard is another possibility. The raised surface should be to the outside of the cover and the child traces over the letters by direct finger contact.



'poly' film or heavy gauge plastic envelope

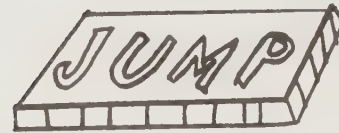


inserted card for tracing



pinpricked 'poly' film without flashcard

- (c) Thick cardboard stencils may be prepared for the child to trace around both the inner and outer edges of the symbol forms.



inside tracing



removed letters
may be used for
outside tracing

These stencils may also be used to prepare other textured surface material. For example, the inside stencils may be used to prepare similar symbols on other card surfaces. By shellacking and adding poster paint, or by spreading glue and sprinkling with sand, the symbols may be reproduced on card surfaces for further variation in tracing experiences. Some children enjoy preparing these aids themselves. Sandpaper and felt letters may also be prepared from these stencils.

- (d) Plasticene may be used for forming letters to superimpose upon flashcard symbols and for direct finger contact by tracing the raised plasticene forms. The child rolls the plasticene into long 'snake' shapes and makes letter shapes from these strips and places them over prepared symbols on card and traces the raised forms.



plasticene strips



printed symbol



raised plasticene symbols

- (e) Clay pens may be prepared to trace symbols with either finger or stylus. A variation of this method is the use of wet sand and finger tracing.



These are just a few of many possible textures a teacher may explore in arousing the kinaesthetic sense. There are many other materials that the teacher might investigate such as different textured cloth (fur, velvet, cereals, etc.)

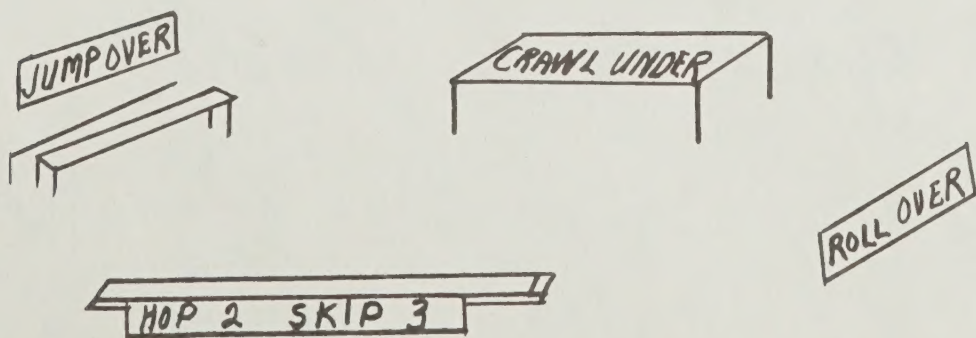
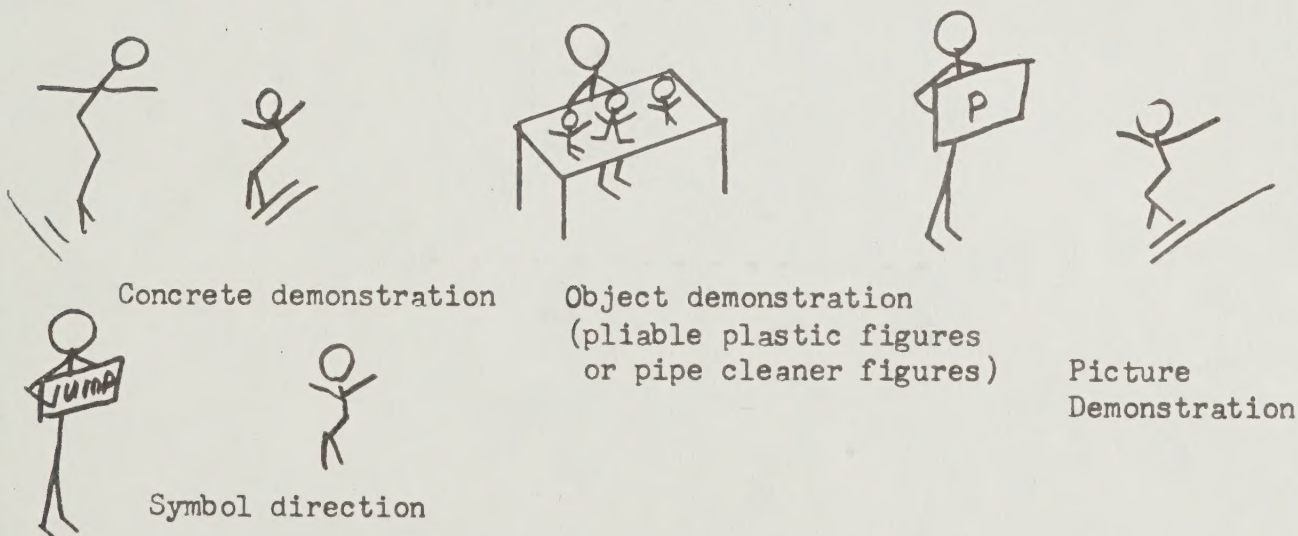
Note: In any of these methods closing the eyes while tracing and vocalizing is useful in eliminating visual difficulties (both distractions and distortions) and helps to fix in the child's memory the feel of the visual form.

6. Gross muscle kinaesthetics

Gross muscle movement in connection with activity words serves to activate gross kinaesthesia for words.

The developmental sequence should proceed from the activity to the symbol representing the activity. Both prepositions and activity words may be taught in this way. Children find obstacle courses in the classroom interesting where they can crawl under chairs, tables, etc., and jump over other objects.

e.g. JUMP - Child performs activity demonstrated by teacher, and as suggested by objects, pictures and printed symbol.



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